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(71) Applicant (for all designated States except US): **SEL-  
COM S.P.A.** [IT/IT]; Via Macedonio Melloni, 12, I-43052  
Colomo (IT).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **GIORGIONI, Paolo**  
[IT/IT]; Via Monte Cagno, 13/A, I-42039 Ligonchio (IT).

(74) Agent: **GOTRA, Stefano**; Bugnion S.p.A, Via Garibaldi,  
22, I-43100 Parma (IT).

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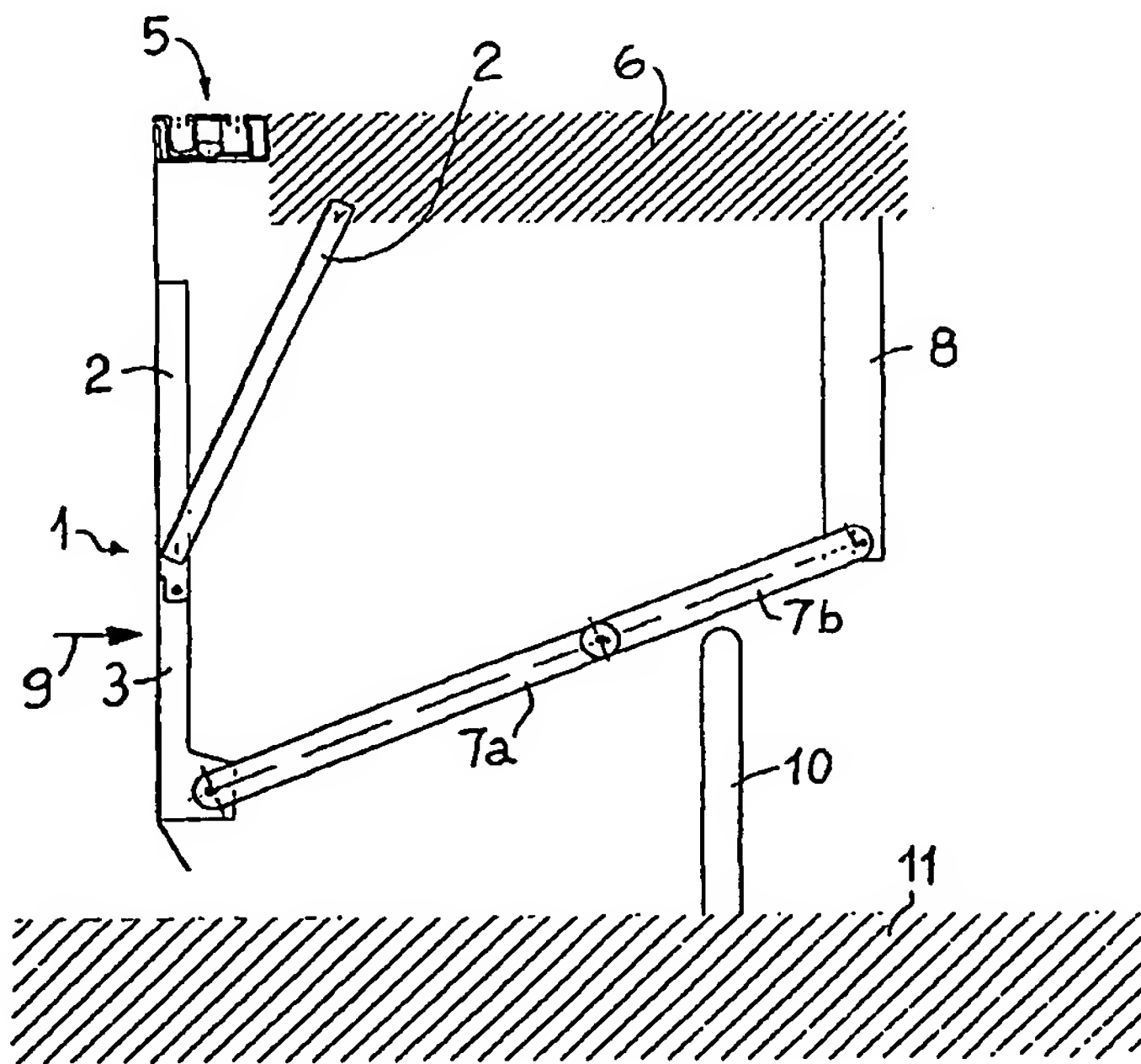
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **MOVABLE SKIRT FOR ELEVATOR CABIN**



(57) Abstract: A movable skirt in a lift or elevator cabin extends inferiorly below the door (5) of the cabin (6), and is so configured as to vary automatically its own extension inferiorly to the cabin (6), reducing it in contact with the floor of the pit or with an element (10) anchored to the floor of the pit, and resuming it by simple force of gravity when the cabin climbs again. The skirt (1) is a telescopic skirt or it can be a skirt comprising a movable portion (3) hinged to a fixed portion (2). The movable portion (3) can be connected to two arms (7a, 7b), one of which (7b) is connected to an inferior extension (8) of the cabin (6), said arms (7a, 7b) being so shaped that under normal conditions they are positioned on a same straight line to react to transverse forces exerted on the skirt (1) preventing the rotation of the movable portion (3).

WO 02/10053 A1

## MOVABLE SKIRT FOR ELEVATOR CABIN

## TECHNICAL FIELD AND BACKGROUND ART.

The present invention relates to a movable skirt in a lift or elevator cabin.

- 5 In the lift sector, the term "skirt" defines a lower extension of the cabin and a similar extension (although normally a smaller one) of the floor door.

Such skirts are normally made of metal plate and have protective functions.

- The cabin skirt, which is applied substantially as a lower extension of the cabin floor, serves the purpose of avoiding the danger of persons falling into the cabin shaft if the  
10 cabin does not stop exactly at the floor, but above it: in this case the skirt fills the empty space that would be created and prevents the person from falling into the cabin shaft.

Current building codes provide for the cabin skirt to extend inferiorly for at least 750 mm.

However, when renovating old systems one may find lift pits with a lesser depth than 750 mm and hence not suitable for housing this skirt.

- 15 To avoid the need for major, costly construction works, the only alternative option available today is that of using a shorter skirt, which however is not compliant with legal requirements.

## DISCLOSURE OF INVENTION.

- The aim of the present invention is to eliminate the aforesaid drawbacks and to make  
20 available a cabin skirt that is compliant with the law and can be applied even when renovating systems whose pits have a depth of less than 750 mm.

A further aim is to obtain this in an extremely simple and economical manner.

- Said aims are fully achieved by the skirt of the present invention, which is characterised by the contents of the claims set out below and in particular in that it is so shaped as to  
25 vary its own height automatically, reducing it from the normal height required, when the

skirt penetrates into the lift pit and the cabin is at the lowest floor of the system.

#### BRIEF DESCRIPTION OF DRAWINGS.

This and other features shall become more readily apparent from the following description of a preferred embodiment illustrated, purely by way of non limiting example, in the accompanying drawing tables, in which:

- Figure 1 shows a front view of the skirt;
- Figures 2 and 3 show a lateral view of the skirt, respectively in position of maximum and minimum extension;
- Figures 4 and 5 show a lateral view of the skirt, in two different operative configurations, in an embodiment variation.

#### BEST MODE FOR CARRYING OUT THE INVENTION.

With reference to the figures, the number 1 globally indicates a movable skirt, comprising a portion 2 that is fixed (relative to the cabin) and is anchored in a known way to the lower part of a door 5 of a lift cabin 6 (or to the cabin itself as shown in Figure 4), only partially shown herein because it is known.

The skirt, as shown in Figures 1, 2 and 3, comprises a movable portion 3, able to slide relative to the fixed portion by means of linear sliding guides 4.

In the example shown in the figure, the movable portion slides on the fixed one, but according to a variation, not shown herein, it can slide within the fixed portion.

The fixed portion has an upper appendage 2a for anchoring the cabin of the lift or elevator, whilst the movable portion 3 has a lower appendage 3a destined to come in contact with a floor or base 11 of the lift pit, automatically causing the sliding of the movable portion 3 relative to the fixed portion 2 with the consequent reduction of the vertical extension of the skirt.

This occurs when the cabin is at the lowest floor of the system, whilst when the cabin

climbs the skirt automatically extends anew and returns to the initial size, shown in Figure 2, which provides for the vertical extension of the skirt to be at least 750 mm.

The extension of the skirt during the climbing of the cabin is produced by the force of gravity itself, i.e. by the weight of the movable portion, which slides downward until  
5 reaching a maximum extension end stop.

The sliding guides 4 are provided with balls to allow for a better sliding of the movable portion 3 relative to the fixed portion 2.

The skirt 1 is therefore a telescopic skirt, with variable vertical extension, which automatically reduces its extension (even below the measure prescribed by building  
10 codes) by contact with the base of the pit and automatically resumes its regular extension as soon as the cabin of the lift or elevator climbs.

The skirt of the present invention therefore allows to obtain the same safety results as fixed skirts in systems which, due to the insufficient depth of the pits, would not be legally compliant if simple fixed skirts were used.

15 According to an embodiment variation shown in Figures 4 and 5, the skirt 1 is not telescopic, but comprises a movable portion 3 hinged to the fixed portion 2 and connected to a pair of arms 7a and 7b, the latter being anchored to a lower extension 8 of the cabin. Under normal conditions the arms are positioned on a same straight line, as shown in Figure 4, in which they are at their bottom dead centre and they constitute a reaction to  
20 any transverse forces exerted on the skirt, for instance in the direction indicated by an arrow 9, in such a way as to prevent the rotation of the movable portion 3.

When instead the cabin descends in proximity to the lower end stop, an element 10 anchored to the base of the shaft in which the cabin travels exerts a pressure against one of the arms, in particular the arm 7b as shown in Figure 5. This causes the rotation of the  
25 movable portion 3 until it lies substantially horizontal with the consequent reduction of

the vertical extension of the skirt 1.

The skirt then resumes its normal configuration when the cabin climbs again, by simple force of gravity which brings the arms 7a and 7b to their lower dead centre.

## CLAIMS

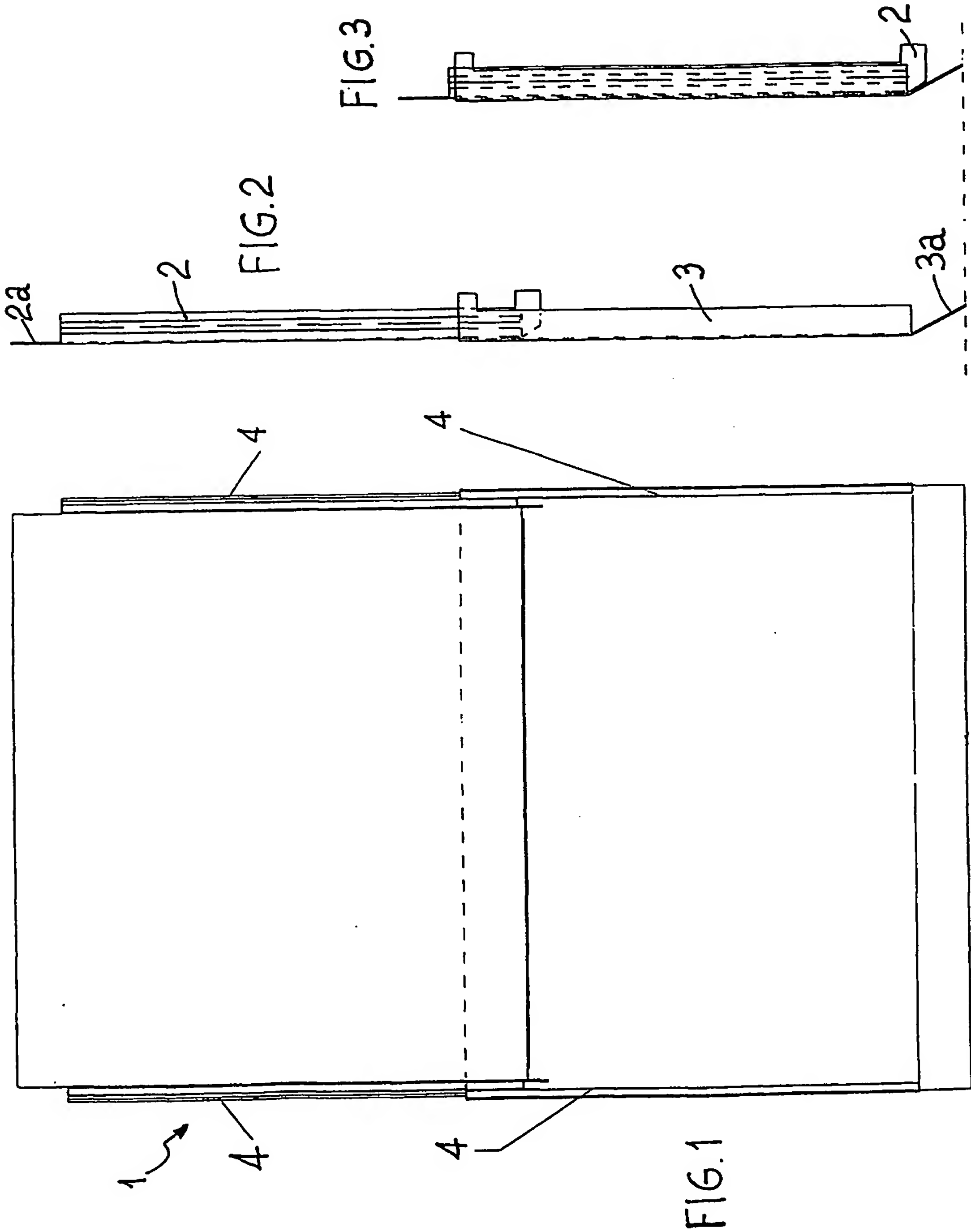
1. A movable skirt in a lift or elevator cabin, of the type extending inferiorly below the door (5) of the cabin (6), characterised in that it is shaped in such a way as to vary automatically its own extension relative to the cabin (6).
- 5 2. A skirt as claimed in claim 1, wherein the skirt (1) reduces its own extension inferiorly to the cabin by contact with a floor (11) of a pit of the lift or elevator when the cabin (6) is at the lowest floor of the system, whilst the skirt resumes its own regular extension inferiorly to the cabin, by simple force of gravity, when the cabin climbs again and the skirt is no longer in contact with the floor (11) or base of the pit.
- 10 3. A skirt as claimed in claim 1, wherein the skirt (1) is a telescopic skirt which reduces its own extension by contact with the floor (11) of a pit of the lift or elevator, and resumes its own regular extension by simple gravity when the cabin (6) climbs again and the skirt is no longer in contact with the floor of the pit.
4. A skirt as claimed in claim 3, characterised in that it comprises a fixed portion (2),  
15 anchored inferiorly to the cabin (6), and a movable portion (3), slidably connected to the fixed portion.
5. A skirt as claimed in claim 4, wherein the movable portion (3) is so shaped as to slide on the fixed one (2).
6. A skirt as claimed in claim 4, wherein the movable portion (3) is so shaped as to  
20 slide internally to the fixed one (2).
7. A skirt as claimed in claim 3, wherein sliding guides (4) are provided for the telescopic skirt.
8. A skirt as claimed in claim 7, wherein balls are present to facilitate the sliding of the skirt (1).
- 25 9. A skirt as claimed in claim 1, wherein the skirt (1) reduces its own extension

inferiorly to the cabin by contact with an element (10) anchored to the floor (11) of a pit of the lift or elevator, when the cabin (6) is at the lowest floor of the system, whilst the skirt resumes its own regular extension inferiorly to the cabin, by simple force of gravity, when the cabin climbs again and the skirt is no longer in contact with said element (10).

5     10. A skirt as claimed in claim 1, wherein the skirt (1) comprises a fixed portion (2) anchored inferiorly to the cabin (6) and a movable portion (3) hinged to the fixed portion (2).

11. A skirt as claimed in claim 10, wherein the movable portion (3) is connected to a pair of arms (7a, 7b), one of which (7b) is connected to an inferior extension (8) of the  
10 cabin (6), said arms (7a, 7b) being so shaped that under normal conditions they are positioned on a same straight line constituting a reaction to transverse forces exerted on the skirt (1) which prevents the rotation of the movable portion (3), whilst when the cabin is at the lower end stop said arms fold to allow the rotation of the movable portion (3) towards such a position as to shorten the vertical extension of the skirt (1).

15     12. Lift or elevator, characterised in that it comprises at least a skirt (1) as claimed in any of the previous claims.





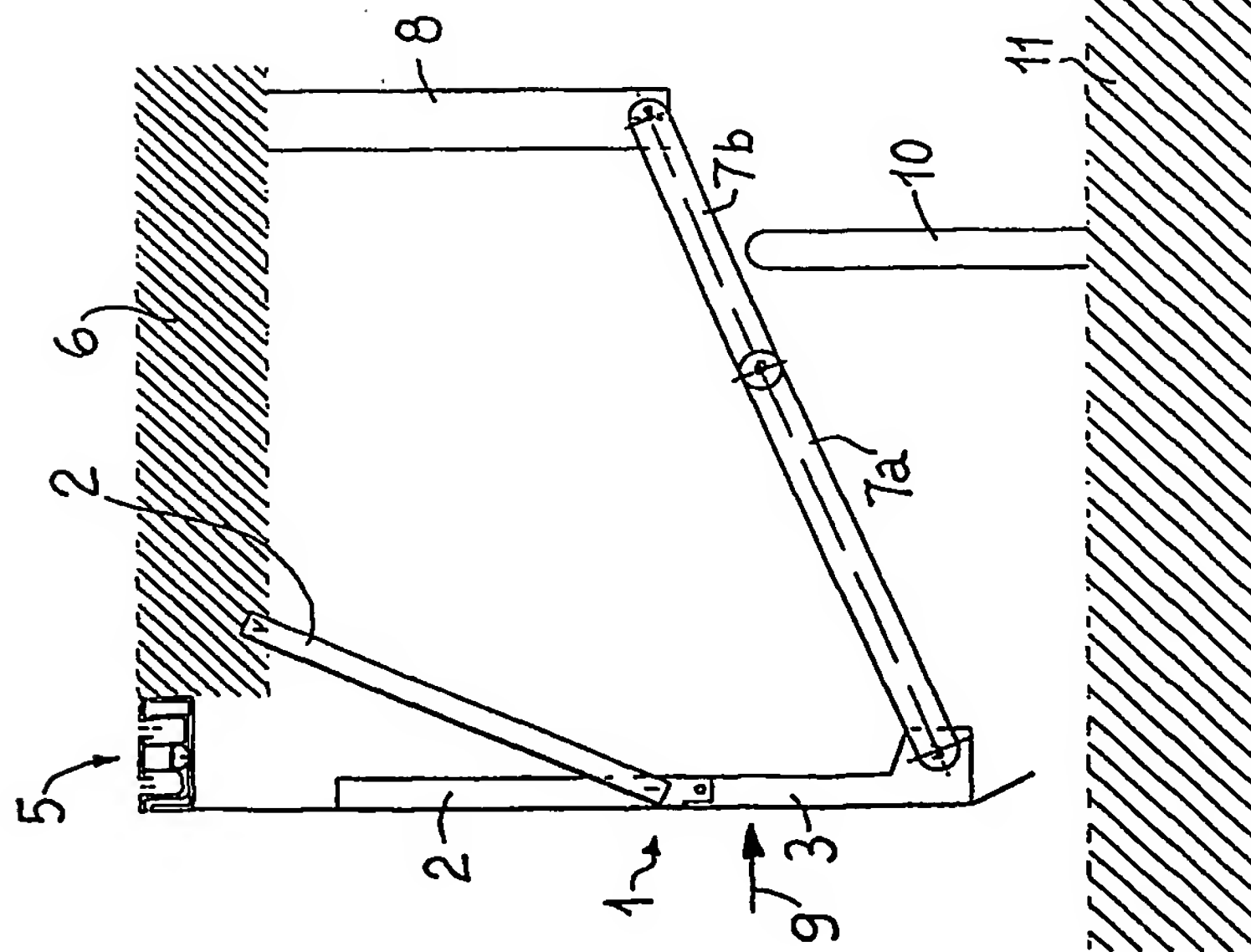


FIG. 4

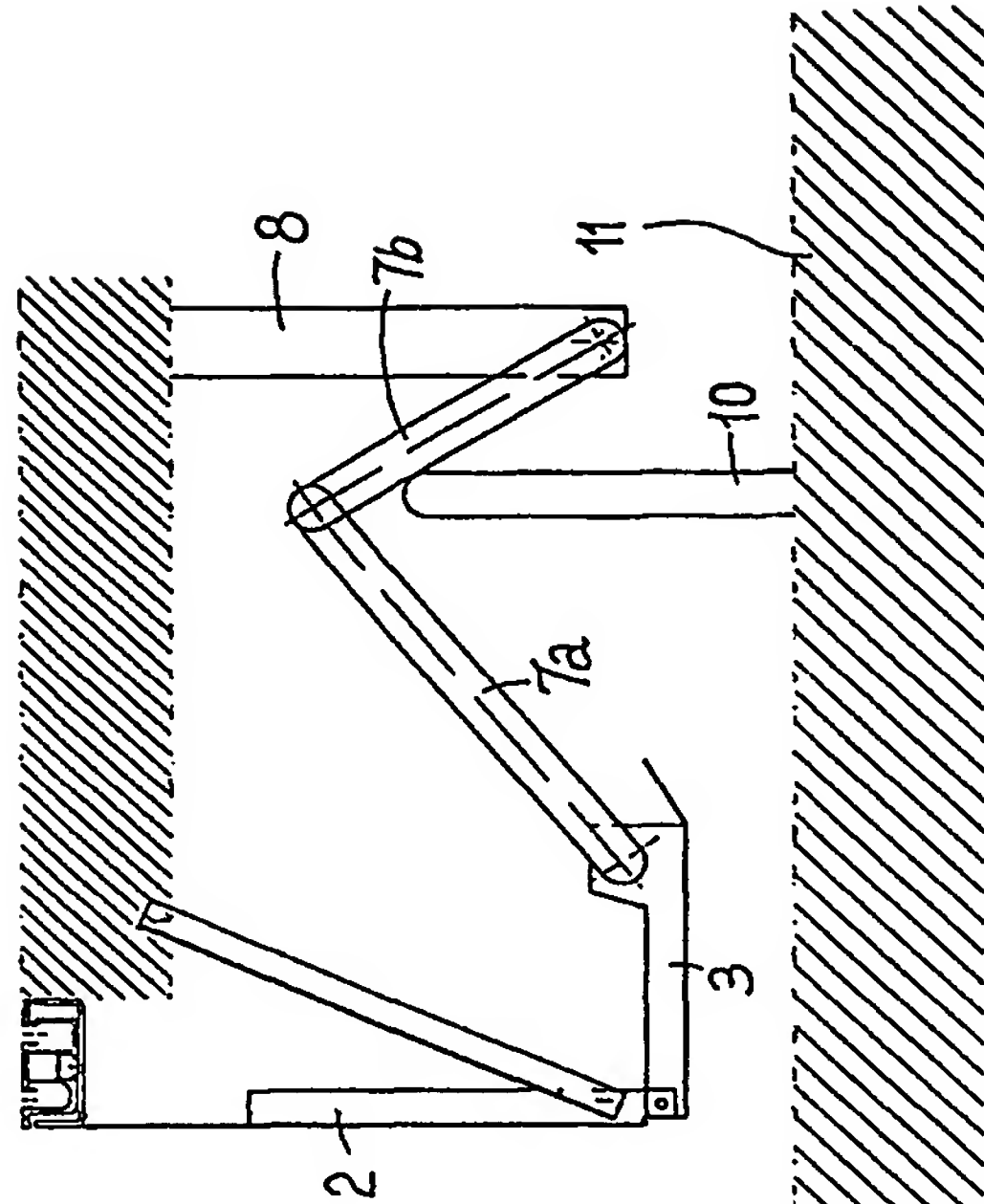


FIG. 5

## INTERNATIONAL SEARCH REPORT

I  
onal Application No  
PCT/IT 01/00140A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 B66B13/28

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 B66B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 60 102386 A (HITACHI LTD; HITACHI ELEVATOR & SERVICE) 6 June 1985 (1985-06-06) figures 5-8	1-4, 6, 7, 12
Y A	----- PATENT ABSTRACTS OF JAPAN vol. 017, no. 612 (M-1509), 11 November 1993 (1993-11-11) -& JP 05 186171 A (TOSHIBA CORP), 27 July 1993 (1993-07-27) abstract; figures 1,2	10 5,8
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☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Nells, Y

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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